THE RELATIONSHIP BETWEEN EMOTIONAL INTELLIGENCE AND COMPONENTS OF COMPETITIVE STATE ANXIETY AMONG SOUTH AFRICAN FEMALE FIELD-HOCKEY PLAYERS

Nicola TINKLER[1], Ankebé KRUGER[1&2] and Julius JOOSTE[3]
[1] Physical Activity, Sport and Recreation Research Focus Area of North-West University
[2] Centre for Health and Human Performance at the North-West University….
[3] Northumbria University, United Kingdom

Ms Nicola Tinkler[1] (Corresponding author)
Physical Activity, Sport and Recreation Research Focus Area (PhASRec) of North-West University, Potchefstroom Campus, Potchefstroom, Republic of South Africa.
Email: nicolatinkler7@gmail.com, Telephone: +2727139117, Fax: +27 562151153
Postal address: Internal Box 494, Private Bag X6001, North-West University, Potchefstroom Campus, Potchefstroom, 2520, South Africa
Prof Ankebé Kruger[1&2]
Physical Activity, Sport and Recreation Research Focus Area (PhASRec) of North-West University, Potchefstroom Campus, Potchefstroom, Republic of South Africa.
Centre for Health and Human Performance at the North-West University, Potchefstroom Campus, Potchefstroom, Republic of South Africa.
Email: Ankebe.Kruger@nwu.ac.za, Telephone: +27182991793, Fax: +27182992022
Postal address: Internal Box 494, Private Bag X6001, North-West University, Potchefstroom Campus, Potchefstroom, 2520, South Africa
Dr Julius Jooste[3]
Psychology Department, Northumbria University, United Kingdom.
Email: julius.jooste@northumbria.ac.uk, Telephone: +44(0)191 2274157
Postal address: Northumberland Building, Northumbria University, Newcastle upon Tyne, NE1 8ST, United Kingdom

ABSTRACT

Emotional awareness and regulation are often associated with improved performance in sports, which raises the question as to the role of emotional intelligence in athletes' optimal performance states. This study determined the relationship between emotional intelligence and components of competitive state anxiety levels among a sample of senior-level South African female field-hockey players (n = 60, *M* age = 21.57, *SD* = 3.65). The Emotional Intelligence Scale and the Competitive State Anxiety Inventory-2 were used to collect the data. Descriptive analyses revealed an above-average emotional intelligence and a low somatic/cognitive anxiety, with self-confidence being low to moderate, among players. Direction of cognitive and somatic anxiety was perceived as neutral, while self-confidence levels were perceived to be facilitative to performance. Pearson's correlation analyses revealed positive associations between players' management of their own and others' emotions, and self-confidence as well as a negative association with cognitive anxiety. A positive association between total emotional intelligence and self-confidence was also revealed with results from the simple linear regression analyses confirming the significant influence emotional intelligence has on players' competitive state anxiety experiences. Essentially, the utility of emotional intelligence intervention in aid of controlling cognitive anxiety and improving and maintaining self-confidence is advocated in coaching and sport psychology practice.

Keywords: Emotions; Hockey; Psychological Demands; Self-confidence; Sports Performance

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INTRODUCTION

Emotional intelligence (EI) is associated with enhanced levels of emotional awareness and control (Serrat, 2010). EI refers to a person's ability to accurately label felt emotions, understand the associative effect on one's thoughts and behaviour, as well as appropriately regulate emotional states (Lane & Wilson, 2011). Serrat (2010:2) described EI as the "ability, capacity, skill, or self-perceived ability to identify, assess, and manage the emotions of oneself, of others, and of groups". Moreover, EI is viewed as an enriching capacity that can be developed to facilitate emotional regulation during demanding situations such as in sports competitions (Ros *et al*., 2013).

In sports, EI is paramount for athletes to effectively cope with the various physical and psychological demands (Weinberg & Gould, 2019) in the pursuit of peak performance (Reeves Silent Night, 2015). Field-hockey (here-after referred to as hockey) is a popular Olympic discipline (Demuth *et al*., 2007) played by both male and female athletes (Elferink-Gemser & Visscher, 2006). Hockey demands an array of technical skills (i.e. the ability to control the ball during consecutive bouts of sprinting, turning, and passing), tactical qualities (i.e. precision, accuracy, anticipation, decision-making, problem-solving, and resilience), as well as self-control of emotions in the quest of scoring goals (Elferink-Gemser *et al*., 2004; Perlini & Halverson, 2006). A player's awareness of a movement or a play on the pitch a split second faster than one's opponent is vital in ball sports such as hockey, as it may offer players a decisive advantage (Schwab & Memmert, 2012). For example, forward players in hockey need to skilfully perform tasks (i.e. playmaking, ability to break for openings, dribbling skills during high-speed actions, and fighting for play) concurrent with recognising and regulating their own and others' emotions whilst maintaining effective communication with teammates (Perlini & Halverson, 2006). Emotional preparedness, a part of mental preparedness, plays a significant role in athletes' decision-making, performance, morale and motivation as well as the overall efficacy of the team (Covassin & Pero, 2004). However, competitive sport is inextricably linked to emotional experiences such as stress and anxiety (Singh, 2017). How athletes respond to and manage their anxiety during competition often dictate their performance (Batinić *et al*., 2014; Jones *et al*., 2005).

The win at all cost expectations associated with sports, along with the strenuous demands placed on players to consistently perform, make players more susceptible to anxiety (Khan & Zafar, 2014; Singh, 1982). Anxiety is a typical emotional state experienced by athletes participating at all levels of sports (Ford *et al*., 2017; Gill & Williams, 2008). Anxiety refers to "an unpleasant psychological state in reaction to perceived stress concerning the performance of a task under pressure" (Ford *et al*., 2017:206) with manifestations experienced cognitively (i.e. worry, feeling of fear and apprehension) and/or somatically (i.e. increased heart rate, blood pressure, muscle tension, sweating) (Cox, 2007). Both cognitive and somatic anxiety impact sports performance (Ampofo-Boateng, 2009) as either variation of too low or too high levels of anxiety might be detrimental to an athlete's performance (Jones, 1995). Researchers concluded that performance would decrease when competitive anxiety (cognitive and/or somatic) increase beyond optimal levels (Aufenanger, 2005; Mellalieu *et al*., 2004; Parnabas, 2015). In this regard, researchers have indicated that higher levels of cognitive anxiety result in lower performance levels in a sample of 67 national, state, district and university hockey players (Parnabas *et al*., 2015). It is generally accepted that a positive interpretation of anxiety could increase athletes' performance, whereas a negative interpretation could be detrimental to performance (Lu *et al*., 2010). Hence Nouriann *et al*. (2011) concluded that the development of psychological factors such as EI could control anxiety states and improve performance in athletes. Notwithstanding, dealing with anxiety remains a pressing challenge for athletes at all levels as the associated negative effects on concentration, memory and other behavioural responses may alter task requirements related to sports performance (Dominikus *et al*., 2009).

Successful hockey performances are associated with high levels of emotional reactivity, stress tolerance, hardiness (e.g. the ability to overcome adversity), and low levels of anxiety (Karp, 2000; MacDougall *et al*., 2003). In this regard, researchers have pointed out that by coping effectively with anxiety, athletes will be better able to control their feelings, achieve their goals, sustain effort and focus, and display higher levels of self-confidence (Humara, 1999; Jones, 1995; Robazza & Bortoli, 2007). If athletes can master a situation in line with their goals and facilitate a beneficial outcome, it may be deemed that those athletes have regulated their emotions in an 'emotionally intelligent' manner (Salovey & Mayer, 1990). In sports, EI is thus a useful ability/skill to regulate emotions which could essentially promote emotional and intellectual growth and ultimately performance in sports (Salovey & Mayer, 1990).

Individuals with a higher EI, appraised stressful situations as more of a challenge than as a threat, which results in lower cognitive anxiety and better coping abilities (Mikolajczak & Luminet, 2008). Furthermore, EI is positively associated with precompetitive emotions which optimise performance (Lane *et al*., 2010) and decreasing

levels of precompetitive anxiety (Lu *et al*., 2010). In this regard, higher levels of EI were positively associated with lowered levels of anxiety in intercollegiate track and field athletes (Lu *et al*., 2010), female basketball players (Boroujeni *et al*., 2012), semi-professional football and paddle players (Castro-Sánchez *et al*., 2018), and swimming, badminton, soccer and volleyball student-athletes (Torkfar *et al*., 2011).

PURPOSE OF STUDY

Despite the propositions made to increase athletes' EI to lower their anxiety levels (Fernández-Berrocal *et al*., 2006; Salovey, 2001), understanding the specific relationship between EI and anxiety levels among hockey players remains unknown. It is against this background, that the following research question is formulated: What is the relationship between EI and the components of competitive state anxiety levels among South African female field-hockey players? We hypothesise that dimensions of EI will negatively associate with anxiety (both somatic and cognitive) and positively with self-confidence.

Findings from this study may provide valuable knowledge and understanding of the relevance of EI in hockey. The role, awareness, understanding, labelling, and communication of a player's own and others' emotions in hockey in an attempt to control individual performance anxiety may offer a fresh perspective on current coaching and behaviour modification programmes employed in hockey and similar contexts. Insight gathered from this study would explicate EI interventions as potential performance aids for coaches, athletes and sports psychologists in the ever-demanding quest for solutions to dealing with athletes' fluctuating anxiety levels in sports. Moreover, evidence of links between EI and anxiety may also provide the impetus to further assess the role of EI in learning and improving skills at a developmental level in sports.

METHODOLOGY

Research Design

The present investigation adopted a descriptive correlational research design with EI treated as the independent variable and the components of competitive state anxiety as the dependent variables.

Participants

A convenient sample of sixty senior-level (N = 60, mean age = 21.57, *SD* = 3.65) South African female field-hockey players, participated in this study. The competitive hockey-playing experience of these players varied between 4 and 22 years. The group consisted of forwards, midfielders, backs and goal-keepers.

Instruments

Emotional Intelligence Scale (EIS)

The EIS (Schutte *et al*., 1998) consists of 33 items and assesses EI based on self-report responses tapping the appraisal and expression of emotions in self and others among the following dimensions: perception of emotion, managing own emotions, managing others' emotions and utilisation of emotions. In some cases, reverse scoring applies (items 5, 28 and 33) and participants respond by indicating their agreement to each of the 33 statements using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A higher score reflects a higher level of EI (Venter, 2003). An overall Cronbach alpha of 0.90 for the 33-item scale was reported, while the mean alpha across samples was 0.87 (Schutte *et al*., 1998). Cronbach's alpha values of the scale's four dimensions ranged from 0.58 to 0.75 in the present study.

The Competitive State Anxiety Inventory-2 (CSAI-2)

The CSAI-2 (Martens *et al*., 1990) is a self-report questionnaire which comprises 27 items, with nine items in each of the three subscales, namely Cognitive Anxiety, Somatic Anxiety, and Self-confidence. Individual items are rated on a 4-point Likert-type scale ranging from 1 (not at all) to 4 (very much so). Subscale scoring is additive, although one somatic anxiety item has reversed scoring, yielding subscale totals ranging from 9 to 36, with 9 indicating a low anxiety/confidence and 36 indicating a high anxiety/confidence. According to Martens *et al*. (1990), the reliability for the CSAI-2 was reported as 0.81 for cognitive anxiety, 0.82 for somatic anxiety and 0.88 for self-confidence. Cronbach's alpha values of the scale ranged from 0.81 to 0.85 in the present study. Concurrent validity assessment on the CSAI-2 demonstrated reasonably consistent relationships with eight previously validated state and trait inventories (Martens *et al*., 1990). Also, a direction scale (Jones & Swain, 1992) was included for the subscale items to enable the participant to rate the degree to which the experienced intensity of each symptom was either facilitative (+3) or debilitative (-3) to subsequent performance. To avoid using negative scores in the current investigation, the

directionality scale was modified to range from 1 (highly debilitative) to 7 (highly facilitative) for each subscale item (Davis & Cox, 2002). Overall subscale perception/direction scores range from 9 to 63, where a score of 9-27 denotes a state of debilitation and a score of 45-63 facilitation. A score ranging from 28-44 is considered as neutral with neither a debilitative or facilitative impression.

Data collection procedure

The managers, coaches and players of the respective teams were informed about the nature of the study while all potential risks and associated benefits were explained. During an information session, players were requested to provide written informed consent before they were allowed to participate in the study. Furthermore, players completed a pencil-and-paper version of the Emotional Intelligence Scale (EIS) (Schutte *et al*., 1998) and the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens *et al*., 1990), which took approximately 30 minutes. The assessments took place in a quiet, comfortable room while the privacy of all the players was ensured.

Ethical clearance

Approval for the research was granted by the Health Research Ethics Committee (HREC) of North-West University (Ethical number: XXX-00069-18-S1).

Analysis of data

The Statistical Package for Social Sciences (SPSS) for Windows (Version 26) was used to analyse the data. Prior to formal analyses, the data was checked for normality (using histograms, QQ plots & Shapiro-Wilk < 0.05), which has satisfied the assumption of a normal distribution. Descriptive statistics (minimum, maximum, means and standard deviations) were used to describe the data after the reliability of the employed measures was determined using Cronbach's alpha coefficient. Pearson's product-moment correlation was used to assess the relationship between the variables. Correlation coefficients was generated for the variables and effect sizes interpreted as small ($r \geq 0.10$), medium ($r \geq 0.30$) and large ($r \geq 0.50$) (Pallant, 2007). To further assess the relationship between EI and components of competitive state anxiety, a series of simple linear regression analyses were performed. All the assumptions for the later analyses were met. However, a composite total EI score was used as the independent (predictor) variable to increase power (account for the relatively small sample) and avoid violation of the assumption for multicollinearity.

RESULTS

Table 1 presents the descriptive statistics (minimum, maximum, means and standard deviations) for the variables assessed in the present study and Cronbach's alpha values of the employed measures. The measures revealed satisfactory to relatively high reliability scores (Taber, 2018) with subscale values that ranged between 0.58 and 0.85. Players revealed high perception of emotions (36.63±4.97) followed by the management of their own emotions (36.20±3.42) and management of others' emotions (30.75±4.35). The players demonstrated low utilisation of emotions (24.50±2.76), with an above-average mean total EI score (128.08±11.02) (Schutte *et al*., 2008). When compared to norm scores generated from large athlete samples (Martens *et al*., 1990), the players' revealed a low to moderate level of self-confidence (25.03±4.39), and a low intensity of cognitive (22.88±5.69) and somatic (21.65±4.70) anxiety. In this regard, the participants held a fairly neutral view of their cognitive (36.23±8.90) and somatic anxiety levels (40.80±7.41) revealing to be perceived as neither facilitative nor debilitative, whereby their self-confidence levels (45.02±9.18) were perceived as facilitative.

<insert Table 1 here>

The Pearson product-moment correlation coefficient (see Table 2) revealed a significant negative association between players' management of their own emotions and cognitive anxiety (r = -0.26, p = 0.04) and a significant positive correlation with players' self-confidence (r = 0.33, p = 0.01). Similarly, significant negative correlations were noted between players' management of others' emotions and cognitive anxiety (r = -0.28, p = 0.03) with significantly positive associations with self-confidence (r = 0.34, p = 0.01). Furthermore, a significant positive association between players' total EI and self-confidence scores (r = 0.27, p = 0.04) was revealed. Effect sizes for all noted significant correlations ranged from low to moderate.

<insert Table 2 here>

The series of simple linear regression analyses (Table 3) exposed EI to be a significant predictor [$F(1, 58) = 4.36$, $p < 0.05$] of players' self-confidence (B = 0.10, p < 0.05) and essentially accounted for 7% of the variance in this variable. Although not significant, EI revealed to exert a negative influence [$F(1, 58) = 2.87$, $p = 0.10$] on players'

approximations of cognitive anxiety (B = -0.11, p = 0.10) explaining 5% of the variance in this variable. No noticeable influence was noted on players' somatic anxiety [$F(1, 58) = 0.14$, $p = 0.71$].

<insert Table 3 here>

DISCUSSION

The ability to accurately facilitate emotions, has been emphasised by researchers to decrease negative factors such as anxiety (Hashempour & Mehrad, 2014). Therefore, this study set out to determine the relationship between EI and components of competitive state anxiety levels among South African female field-hockey players. Results reveal that being more proficient in managing own and others' emotions will lead to lower levels of cognitive anxiety among players. This finding gives credence to the work of Mayer (2004) who stated that individuals with an ability to regulate their own as well as others' emotions can solve emotional problems, which requires less cognitive effort. When able to solve emotional problems, players might experience fewer negative thoughts and self-doubt, which decreases experiences of cognitive anxiety (Juuso, 2011), especially in a team sport as found in the present study. If athletes regulate emotions in a facilitating manner, negative emotions such as anxiety (cognitive and somatic) will decrease significantly (Hashempour & Mehrad, 2014). Additionally, the ability to manage emotions helps to organise one's thoughts and memory, which assist an individual in (re)focussing that potentially eliminates debilitative emotions and decrease cognitive anxiety (Bahrololoum *et al*., 2012). Furthermore, managing others' emotions refers to actions that would tend to maintain or improve other people's positive moods (Ciarrochi *et al*., 2000) as well as the ability to display empathy (Schutte *et al*., 1998). From an empathy perspective, Singer (2006) indicated empathic understanding of others to have a motivational influence on human interactions that supresses threatening behaviour and enhances the emotional bond within a group. Based on this notion, it can therefore be concluded that hockey players who experiences strong emotional connections (empathic understanding of each other) within the team, are therefore more likely to experience less apprehension, fear and worry (cognitive anxiety).

As expected, a positive association between total EI and self-confidence was revealed with further findings identifying players' ability to manage their own emotions and the emotions of others to be a significant predictor of their level of self-confidence. Similarly, other researchers agree that if players learn how to manage their own emotions, their self-confidence can be increased (Mowlaie *et al*., 2011; Rajeshwari & Raj, 2017). Likewise, Bahrololoum *et al*. (2012) stated that self-confidence protects athletes from negative and debilitative feelings elicited by anxiety. As mentioned previously, the management of others' emotions includes actions that would tend to maintain or improve other people's positive moods (Ciarrochi *et al*., 2000). In this regard, supporting evidence reported that spending time with positive and supportive people will increase self-confidence (Challis, 2019). In turn, if an individual is positive and supportive, s/he is more likely to get a positive response from others, which will further enhance self-confidence in the task at hand (Challis, 2019). Therefore, players who can regulate and manage their emotions effectively during performance are more likely to be confident in mastering their performance tasks.

With regards to the participants' interpretation/perception of competition state anxiety, cognitive and somatic anxiety symptoms were viewed as neutral (neither facilitative nor debilitative) and self-confidence levels were perceived as facilitative. Research indicated that high levels of self-confidence protect players against the debilitating interpretation of competitive anxiety (Hanton *et al*., 2004). Likewise, when self-confidence levels were high, increases in anxiety were reported to lead to positive perceptions of control and facilitative interpretations (Hanton *et al*., 2008). Supporting researchers concluded that self-confidence is an essential quality for elite athletes to possess in order to protect against potentially debilitating thoughts and feelings experienced in competitive situations (Hanton *et al*., 2004). Similarly, by using specific interventions through increasing EI, will inadvertently also increase self-confidence (as seen in the present study), which will result in players not experiencing their competitive state anxiety as debilitative to their performances. In addition, players can rationalise their thoughts and feelings, allowing them to cope more competently by altering the direction of their interpretations (Hanton *et al*., 2008).

PRACTICAL APPLICATIONS/RECOMMENDATIONS/LIMITATIONS

Overall, the results emphasise the value of EI in relation to anxiety. Specifically, regulation of emotions (managing own and others' emotions) is inversely related to cognitive anxiety and key to enhancing self-confidence.

Despite the results contributing to current research in sport, the generalisability to other sports is cautioned due to the small sample size and homogeneity of participants. However, the purpose of this research was not to generalise results to hockey in general or other female sports, but rather to test the hypothesis that implies a relationship between EI and anxiety/self-confidence levels of players. We propose that future research investigate the effect of EI on the perception/interpretation of competition state anxiety and whether there is a difference between male and female, amateur and professional athletes. Also, results are based on participants' self-reported data at a specific time

of the competitive season and not measured at various intervals throughout the season. By exploring athletes' anxiety levels concerning different seasons (pre-season, competition season, and post-season) would better inform practitioners on the impact of EI on players' anxiety/self-confidence levels. Also, future research should examine the relationship between EI and anxiety with players' on-field performance at different stages throughout the season (Petrides, 2011). The current study also did not account for age, playing experience or took players' previous exposure to mental skills training into account, however, we acknowledge that it may influence the results. Lastly, the effect of EI interventions aimed at enhancing players' level of EI and overall team performance should also be investigated.

Despite these limitations, findings from this study provide sport psychologists, coaches, sport scientists and hockey players with some clarity regarding the role EI plays on anxiety among hockey players. This study will be valuable for comprehending and addressing the role of emotional intelligence in terms of anxiety levels and self-confidence of female hockey players. It is therefore suggested that athletes and coaches reinforce and practise EI as an additional means to combat the debilitative effect of heightened anxiety within hockey players. Consequently, for athletes to perceive their self-confidence as facilitative to performance, emphasis should be placed upon developing and strengthening EI development within their training programs. In addition, tactical hockey skills such as precision, anticipation, decision-making, problem solving, and self-control of emotions may also be improved by decreasing anxiety and enhancing self-confidence.

CONCLUSION

The results of the present study indicate a significant influence of emotional intelligence on players' competitive state anxiety experiences. Based on this preliminary evidence, athletes and coaches may consider EI interventions as an additional means to combat the debilitative effect of heightened anxiety and as a resource for enhancing self-confidence among female field-hockey players.

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Table 1. **CRONBACH'S ALPHA VALUES AND DESCRIPTIVE STATISTICS OF FEMALE FIELD-HOCKEY PLAYERS**

Subscales	Minimum	Maximum	Mean	SD	α
Age	17.00	29.00	21.57	3.65	
Emotional Intelligence Scale (EIS)					
Perception of emotion	24.00	47.00	36.63	4.97	0.75
Managing own emotions	28.00	44.00	36.20	3.42	0.64
Managing other's emotions	17.00	40.00	30.75	4.35	0.71
Utilisation of emotions	19.00	30.00	24.50	2.76	0.58
Total EIS score	105.00	157.00	128.08	11.02	0.67
Competitive State Anxiety Inventory-2 (CSAI-2)					
Cognitive anxiety intensity	12.00	33.00	22.88	5.69	0.85
Somatic anxiety intensity	12.00	32.00	21.65	4.70	0.85
Self-confidence intensity	15.00	34.00	25.03	4.30	0.82
Cognitive anxiety direction	19.00	58.00	36.23	8.90	0.78
Somatic anxiety direction	18.00	55.00	40.80	7.41	0.71
Self-confidence direction	21.00	60.00	45.02	9.18	0.86

α = Cronbach's alpha; *SD* = standard deviation

***Table 2*. PEARSON'S PRODUCT-MOMENT CORRELATIONS BETWEEN EMOTIONAL INTELLIGENCE AND COMPETITIVE STATE ANXIETY INVENTORY SUBSCALES**

EIS		CSAI-2		
		Cognitive anxiety	**Somatic anxiety**	**Self-confidence**
Perception of emotion	Coefficient	-0.18	0.07	-0.01
	Sig. (2-tailed)	0.18	0.62	0.94
Managing own emotions	Coefficient	-0.26#	0.06	0.33#
	Sig. (2-tailed)	0.04*	0.64	0.01*
Managing others' emotions	Coefficient	-0.28#	-0.13	0.34##
	Sig. (2-tailed)	0.03*	0.33	0.01*
Utilisation of emotions	Coefficient	0.22	0.20	0.13
	Sig. (2-tailed)	0.10	0.12	0.33
Total emotional intelligence score	Coefficient	-0.22	0.05	0.27#
	Sig. (2-tailed)	0.10	0.71	0.04*

* $p \leq 0.05$; ** $p < 0.01$ # Small effect size; ##Medium effect size

Table 3. **SUMMARY OF LINEAR REGRESSION ANALYSES FOR THE IMPACT OF EMOTIONAL INTELLIGENCE ON ANXIETY AND SELF-CONFIDENCE**

Variable	R^2	R	Std. error	β	Sig.
Cognitive anxiety	0.05	0.22	0.07	-0.22	0.10
Somatic anxiety	0.00	0.05	0.06	0.05	0.71
Self-confidence	0.07	0.27	0.05	0.27	0.04*

*Statistically significant at $p < 0.05$; **Statistically significant at $p < 0.01$; β = Beta of standardised coefficients